



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

08/893,917

07/11/1997

KARL A. LITTAU

AM2119/T2130

8435

57385 7590 09/05/2007
TOWNSEND AND TOWNSEND AND CREW LLP / AMAT
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER

ZERVIGON, RUDY

ART UNIT

PAPER NUMBER

1763

MAIL DATE

DELIVERY MODE

09/05/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 08/893,917	Applicant(s) LITTAU ET AL.	
	Examiner Rudy Zervigon	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-20, 22-24, 27 and 28 is/are pending in the application.
- 4a) Of the above claim(s) 16-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-24, 27 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 1997 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 26, 2007 and June 28, 2007 is entered.

Election/Restrictions

2. This application contains claims 16-20 drawn to an invention nonelected with traverse in Paper No. March 3, 2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 22-24, and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Shang; Quanyuan et al. (US 5788778 A). Shang teaches a method (column 4, lines 23-63; column 6, lines 13-23) of removing residue from a substrate processing chamber (10; Figure 1; column 4, lines 4-15), said method (column 4, lines 23-63; column 6, lines 13-23) comprising the steps of: forming a plasma remotely (46; Figure 1; column 4, lines 40-53) with respect to said chamber (10; Figure 1; column 4, lines 4-15), said plasma including a plurality of reactive radicals;

Art Unit: 1763

forming a flow of said reactive radicals traversing toward said chamber (10; Figure 1; column 4, lines 4-15); forming a nonplasma (32,34; Figure 1; column 4, lines 23-31) diluent gas flow, wherein said nonplasma diluent gas flow comprises at least one of an inert gas or a reduction gas (hydrogen as reducing gas; column 5, lines 1-5); mixing said flow of said reactive radicals and said diluent gas flow at a mixing location ("T" location at 33) downstream of a location (where "57" is detailed) of forming said flow of said reactive radicals and anterior to said chamber (10; Figure 1; column 4, lines 4-15) to form a gas-radical mixture; and flowing said gas-radical mixture into said chamber (10; Figure 1; column 4, lines 4-15), as claimed by claim 22

Shang further teaches:

- i. The method (column 4, lines 23-63; column 6, lines 13-23) as recited in claim 22 wherein said flow of reactive radicals and said gas flow are established to maintain a pressure within said chamber (10; Figure 1; column 4, lines 4-15) below one torr (column 5, lines 8-13), as claimed by claim 23
- ii. The method (column 4, lines 23-63; column 6, lines 13-23) as recited in claim 22 wherein said reactive radicals comprise atoms associated with a reactive gas, with said reactive gas being selected from a group consisting of NF_3 (column 5, lines 8-13), dilute F_2 , CF_4 , C_2F_6 , C_3F_8 , SF_6 , and ClF_3 , as claimed by claim 24
- iii. The method (column 4, lines 23-63; column 6, lines 13-23) as recited in claim 22 wherein said chamber (10; Figure 1; column 4, lines 4-15) has components therein, with a subset of said radicals in said gas-radical mixture reacting with said components creating a residue (column 6, lines 13-23) and further including the step of exhausting said residue,

with a rate at which said residue is exhausted depending upon a rate of said diluent gas flow, as claimed by claim 27

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shang; Quanyuan et al. (US 5788778 A). Shang is discussed above. Shang further teaches “user-selected flow rates” (column 4, lines 53-63). Shang does not teach the method (column 4, lines 23-63; column 6, lines 13-23; column 6, lines 32-39) as recited in claim 22 wherein said diluent gas flow travels at a first rate and said flow of said reactive radicals travel at a second rate with a ratio of said first rate to said second rate being at least 2:1, as claimed by claim 28.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the relative flow rates of Shang’s gas sources.

Motivation to optimize the relative flow rates of Shang’s gas sources is for “achieve optimum of performance for a particular system” as taught by Shang (column 6, lines 32-39). It would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

Response to Arguments

7. Applicant's arguments filed June 28, 2007 have been fully considered but they are not persuasive.

8. Applicant states:

“

Shang thus teaches that a diluent gas, or a “minor carrier gas” using Shang's lexicography, is mixed with reactive radicals at a location where the reactive radicals are formed. Claim 22, however, requires that this mixing of a diluent gas and reactive radicals occurs downstream from where the reactive radicals are formed. Furthermore, FIG. 1 at 52 and 53 in Shang clearly shows that this cited reference teaches that a mixing of a diluent gas and reactive radicals occurs at a location where the flow of said reactive radicals is formed, not downstream of the reactive radical formation location as claimed in claim 22. Therefore, Shang does not teach all the elements of claim 22 as amended and thus this cited reference does not anticipate independent claim 22 or the dependent claims 23, 24, 27, and 28 for the same reasons

“

In reposnse, it is well established that claim terms are issued their “plain meaning” according to MPEP 2111.01: Claim terms are presumed to have the ordinary and customary meanings attributed to them by those of ordinary skill in the art. *Sunrace Roots Enter. Co. v. SRAM Corp.*, 336 F.3d 1298, 1302, 67 USPQ2d 1438, 1441 (Fed. Cir. 2003); *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1298 67 USPQ2d 1132, 1136 (Fed. Cir. 2003). Applicant's specification definition cannot be read into the claims. Specifically, that Shang forms a nonplasma (32,34; Figure 1; column 4, lines 23-31) diluent gas flow is evident from the two


Art Unit: 1763

gases (32; “Gas” x 2; Figure 1) of Shang that from the claimed diluent gas flow. Applicant appears to believe that the plasma and non-plasma gas of Shang are mixed at “remote activation chamber 46”. This is completely wrong. *As claimed*, Shang clearly shows forming a plasma remotely (46; Figure 1; column 4, lines 40-53) with respect to Shang’s chamber (10; Figure 1; column 4, lines 4-15), Shang’s plasma including a plurality of reactive radicals (as is required in all plasmas); forming a flow (in 57) of Shang’s reactive radicals traversing toward Shang’s chamber (10; Figure 1; column 4, lines 4-15); forming a nonplasma (32,34; Figure 1; column 4, lines 23-31) diluent gas flow, wherein Shang’s nonplasma diluent gas flow comprises at least one of an inert gas or a reduction gas (hydrogen as reducing gas; column 5, lines 1-5); mixing Shang’s flow of said reactive radicals and Shang’s diluent gas flow at a mixing location (“T” location at 33) downstream of a location (where “57” is detailed) of forming Shang’s flow of said reactive radicals and anterior to Shang’s chamber (10; Figure 1; column 4, lines 4-15) to form a gas-radical mixture, as claimed by amended claim 22.

Art Unit: 1763

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.


9/3/7